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APPLICATION NUMBER: 60/427,533

FILING DATE: November 19, 2002

RELATED PCT APPLICATION NUMBER: PCT/US03/37188

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PROVISIONAL APPLICATION FOR PATENT COVER SHEET
This is a request for filing a **PROVISIONAL APPLICATION FOR PATENT** under 37 CFR 1.53(c)
Express Mail Label EV 169612291 US

INVENTOR(S)				
Given Name (first and middle [if any])		Family Name or Surname	Residence (City and either State or Foreign Country)	
Andrew R. Dennis J		Barron Flood	Houston, Texas Oberlin, Ohio	
<input type="checkbox"/> Additional inventors are being named on the _____ separately numbered sheets attached hereto				
TITLE OF THE INVENTION (280 characters max)				
FABRICATION OF LIGHT EMITTING FILM COATED FULLERENES AND THEIR APPLICATION FOR IN-VIVO LIGHT EMISSION				
CORRESPONDENCE ADDRESS				
Direct all correspondence to <input checked="" type="checkbox"/> Customer Number 23505				
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<input type="checkbox"/> Firm or Individual Name				
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ENCLOSED APPLICATION PARTS (check all that apply)				
<input checked="" type="checkbox"/> Specification Number of Pages 3				
<input type="checkbox"/> CD(s), Number				
<input type="checkbox"/> Drawing(s) Number of Sheets *				
<input type="checkbox"/> Other (specify)				
<input checked="" type="checkbox"/> Application Data Sheet. See 37 CFR 1.76				
METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT				
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27.				
<input type="checkbox"/> A check or money order is enclosed to cover the filing fees				
<input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: 03-2769				
<input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached				
FILING FEE AMOUNT (\$)				
\$80.00				
The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.				
<input checked="" type="checkbox"/> No				
<input type="checkbox"/> Yes, the name of the U.S. Government agency and the Government contract number are:				

Respectfully submitted,

SIGNATURE 

TYPED OR PRINTED NAME Marcella D. Watkins

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Date November 19, 2002

REGISTRATION NO. 36,962

DOCKET NO. (if appropriate) 1789-09501

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is used by the public to file (and by the PTO to process) a provisional application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the complete provisional application to the PTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Office, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Box Provisional Application, Assistant Commissioner for Patents, Washington, D.C. 20231.

Application Data Sheet

APPLICATION INFORMATION

Application Type:: Provisional
Subject Matter:: Utility
Title:: FABRICATION OF LIGHT EMITTING
FILM COATED FULLERENES AND THEIR
APPLICATION FOR IN-VIVO LIGHT
EMISSION

Attorney Docket Number:: 1789-09501
Small Entity?:: Yes

APPLICANT INFORMATION

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Fabrication Of Light Emitting Film Coated Fullerenes And Their Application For In-Vivo Light Emission

The invention relates to the fabrication of thin films of various types of light emitting materials, including but not limited to photonic bandgap engineered materials, III-V and II-VI binary, ternary, and quaternary compound semiconductors, polymers, liquid crystals and certain classes of organic compounds, on the surface of fullerenes.

The films may be used as quantum coatings to provide stimulated emission (photoluminescence). If a non-spherical fullerene, such as C_{70} or a single wall or multiwall nanotube is employed, linearly polarized stimulated emission may be produced. The surface of the light emitting film may be functionalized to allow attachment to specific biological entities. Subsequent photoluminescence may be used to effect biological changes.

Fabrication of the light emitting film in the present invention is based on an invention disclosure made by Professor Andrew R. Barron to Rice University in June 2001. The Barron/Rice invention describes a conceptual approach for the fabrication of inorganic materials as thin films, coatings or composites. The fabrication takes place under mild conditions from solution.

A key step in the present process is initiating a uniform heterogeneous growth of the light emitting film directly on the activated surface of fullerenes; growth continues to a predetermined thickness established by the desired ratio of coated fullerene volume to the thickness of the light emitting film.

This invention uses a previously disclosed general concept for the growth of thin films, coatings and composites from solution under ambient or low temperature conditions. The general steps are provided below.

The invention is aimed at the creation of composition of matter consisting of a fullerene or carbon nanotube (or other inert chemically functionalized nanoparticle such as an alumoxane) coated by a light emitting thin film, see Figure.



A wide range of light emitting film nanoparticles have been grown by solution. These include: ZnS, CdS, CdSe, GaAs, InP, various polymers and organic compounds. A range of methods may be used to accomplish the film growth. However, it is important to functionalize the surface of the fullerene "seed" such that heterogeneous crystal film growth occurs.

In order to specifically coat the fullerenes, seed growth must be initiated on the surface of the fullerene. This is accomplished by partially hydroxylation of the surface of the fullerene, C_{60} .

be selected for maximum effectiveness by the choice of light emitting film and quantum layer deposition parameters; 3) therapy can be administered either by direct injection of the nanoparticle light sources into targeted structures, or intravenously, as conditions dictate.

It is sometimes desirable to introduce non-invasive light emitting structures in vivo for therapeutic or diagnostic purposes. One of ordinary skill in the art will understand the need to assure that there are no undesirable chemical interactions between the light emitting layer and the in vivo environment.

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